

Instruction Manual

Paraly SW 111 Software for PDA and PC



Knick

Elektronische Messgeräte GmbH & Co. KG

P.O. Box 37 04 15

D-14134 Berlin



Phone: +49 (0)30 - 801 91 - 0

Fax: +49 (0)30 - 801 91 - 200

Internet: <http://www.knick.de>

knick@knick.de

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Notices

Safety Information

Be sure to observe the safety precautions given in the product's instruction sheet for the commissioning of the universal transmitter!

Registered Trademarks

The following registered trademarks are used in this instruction manual without further marking

Paraly®

PolyTrans®

ThermoTrans®

SensoTrans®

are registered trademarks of Knick GmbH & Co. KG, Germany

Windows®

is a registered trademark of Microsoft Corp., USA

Introduction

The PolyTrans P 32000 universal transmitters provide connection possibilities for all standard thermocouples, resistance thermometers, strain gage full bridges, resistors, and potentiometers.

When a resistance thermometer or a resistor is connected, 2-, 3-, or 4-wire configuration is automatically recognized at device startup.

Note: When the configuration is changed from 2-wire to 3-wire (or 4-wire) or from 3-wire to 4-wire, this is only recognized after the device's next restart (power turned off/on). The output signal is adjustable to 0 / 4 ... 20 mA, or 0 ... 5 / 10 V. The calibrated range selection is performed using DIP and rotary coding switches (cf instruction sheet of PolyTrans P 32000 universal transmitter).

These adjustments can also be made with the user-friendly, menu-guided **Paraly SW111** communication software using a PDA or PC with infrared capability (IR port). That means that you can easily and safely adjust the transmitter via “infrared remote control” without having to dismantle it.

In addition to the basic adjustments provided by DIP and rotary coding switches, the software opens a whole number of further options such as:

- Access to further sensor types
- Input of customer-specific linearization curves
- Read-out of the connection configuration
- Use of extensive diagnostics functions
- Parameter setting, documentation, and maintenance

Moreover, the output current or output voltage can be specified independently of the input value using the simulation function – for plant commissioning or revision.

Introduction

Paraly SW 111 is used for configuring the PolyTrans P 32000, ThermoTrans P 32100, SensoTrans DMS P 32200, and SensoTrans R P 32300 transmitters. Only the device-specific sensor types are supported.

Basics

System Requirements

Software Installation

Infrared Communication

Software Start

Basics

System Requirements

- PDA or PC with infrared capability
- PDA operating system: Windows Mobile 2003 or higher
- PC operating system: Windows XP

PDA Software Installation

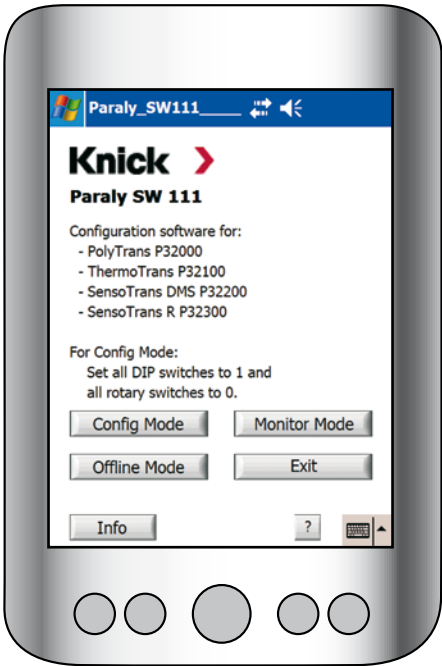
Please refer to the instruction manual of your PDA for information on how to install the software.

PC Software Installation

Copy the folder with the software to your PC.
Then double-click the **Paraly_SW111.exe** file.

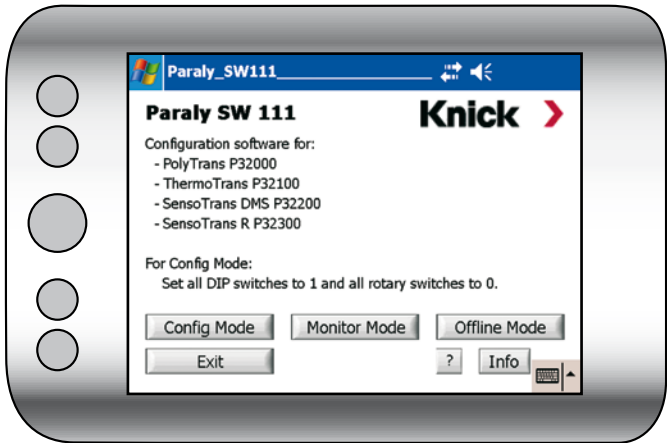
Basics

Portrait or Landscape Format (PDA only)



Since the IR ports can be located on different sides of the PDA, depending on the model, it might be useful to switch the display from portrait to landscape format for ergonomic purposes. How that is done can be found in the manufacturer specifications of your device.

It is important that this selection is made **before** Paraly SW111 is started. The following explanations of the software operation are presented in portrait format.

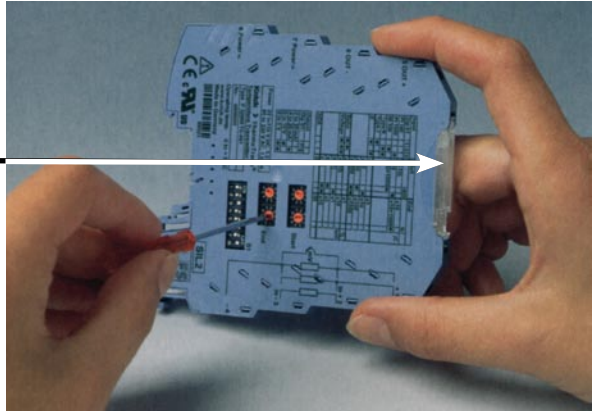


The software functions are identical for both types of representation. The arrangement of buttons or entry fields may differ.

Basics

Be sure to observe the following!

When you want to communicate between PDA/PC and transmitter using infrared data transmission, the IR port of the transmitter with which you want to exchange data must be switched on using the front button. This can be done by using a screwdriver (max. 2.5 mm blade width) which is safely insulated against the voltage applied to the input. There is an appropriate opening in the front panel.



Activation of the IR port is signaled by a flashing yellow LED on the device front. Connection must be established within 60 seconds. If this time is exceeded (timeout), the IR port will be deactivated, the yellow LED stops flashing. Timeout for the interruption of an existing IR connection is 10 seconds. Communication with several transmitters at the same time is not provided.

Important notice: The transmitter must be connected to power supply.

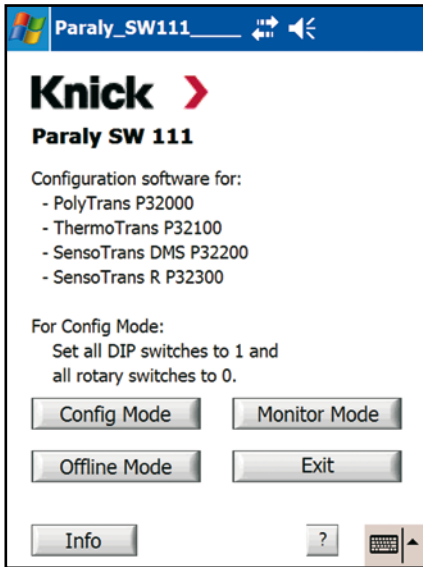


Furthermore, you must ensure direct intervisibility between the IR ports.

The distance between the two devices depends on the capability of the IR port, among others. We recommend an optimal distance of 20 to 40 cm.

Basics

Start Screen



In **Config Mode** you can adjust numerous parameters of the transmitter during operation. It provides much more adjustment possibilities than the DIP switches on the transmitter. You must only make sure that the devices can “see” each other and that the IR port of the respective transmitter has been activated. All DIP switches of that transmitter must be set to 1 (ON), the rotary switches to 0. The configuration data can be stored and are also available in offline mode.

The **Monitor Mode** is a pure read mode. It provides access to the configuration and current measurement data and to possible error messages of the transmitter. You only have to activate the IR port of the transmitter. Other than in Config Mode, the DIP and rotary switch positions do not have to be changed. This allows capturing the adjustments which have been made directly on the transmitter using the DIP switches. These configuration data can be stored in files and are then available in other modes for further processing. In Monitor Mode, the transmitter adjustments cannot be changed.

The **Offline Mode** allows calling up stored configuration data and editing them or creating completely new configurations. This has the advantage that you can produce configurations “on stock” without requiring direct access to the transmitter. From the **Config Mode** you can send the stored data to the transmitter at any time.

Operation

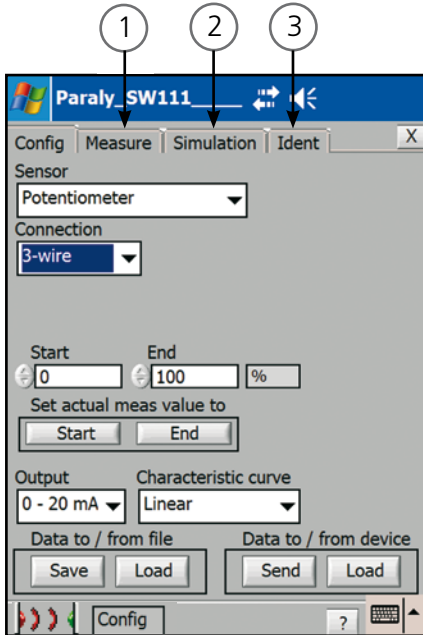
Config Mode

Offline Mode

Monitor Mode

Simulation Mode

Config Mode



Measure (1) Tab:

Display of measurement data and access to additional device data and error messages (See Page 26)

Simulation (2) Tab:

Here you can test your installation (see Page 27).

Ident (3) Tab:

Display and entry of tag as well as information on the number of configurations made. (see Page 28).

Caution! The following adjustments change the transmitter function. They become effective as soon as they are sent to the device by selecting **Send Data to Device**. Before sending a new configuration to the transmitter you must therefore make sure that it does not endanger the installation.

The figure shown on the left shows an example of the Config tab. It may differ slightly depending on the transmitter and sensor.

The following fields and buttons are always present.

Sensor - Sensor type

Start/End - Adjusts measurement range. The unit is automatically selected depending on the sensor selection.

Set actual meas value to - Takes the currently measured value as start or end value of the range.

Output - Adjusts output signal type

Characteristic curve - Fits transfer curve (see Page 33 et seq. for details)

Save/Load Data to / from file

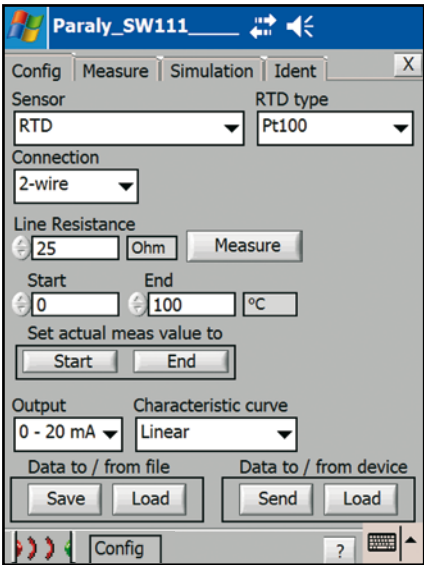
- "Save" the current configuration as file / "Load" a configuration file

Send/Load Data to / from device

- "Send" the configuration to the transmitter / "Load" the configuration from the transmitter

Config Mode

Config Tab - Selection Fields



- Click at ▼ in the **Sensor field** to select the type of sensor (here RTD)
- Connection field** to select the sensor connection
- Sensor type field** to select the sensor (here Pt100)

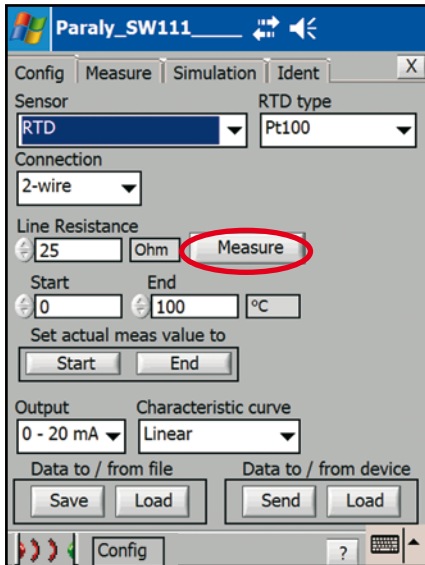
Depending on the sensor selected, there may be more parameters which will be presented below. The following table shows a complete list of selectable parameters.

Type of sensor	Sensor connection	Sensor
RTD	2-wire, 3-wire, 4-wire, differential	Pt100, Pt1000; Ni100, Pt XXX, Ni XXX
Thermocouple	Single, Sum, Difference	B, E, J, K, L, N, R, S, T, U, W3Re/W25Re, W5Re/W26Re
Resistor	2-wire, 3-wire, 4-wire	
Potentiometer	3-wire, 4-wire	
Voltage		
Strain gage	Excitation: internal, external	

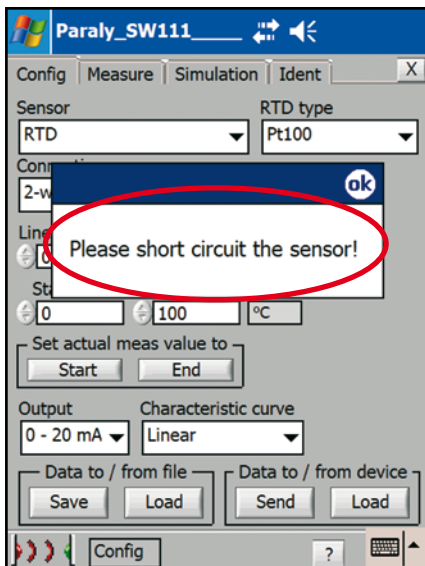
When using a resistance thermometer or resistor, automatic recognition of the sensor connection upon device start is disabled when you select 2-, 3-, or 4-wire connection. When the sensor is connected in a different way (e.g. by mistake), this is signaled by the “Identification of connection” error message. Enter the values for Start of range and End of range corresponding to the configuration of your point of measurement and the desired measurement range. You can also take the currently measured value as Start or End value. To do so, select the Start or End button beneath “Set actual meas to”.

Config Mode

Config Tab - RTD 2-Wire / RTD Difference / Resistor 2-Wire



With **RTD 2-wire** connection selected (also with “Resistor 2-wire” and “RTD Difference”) you either enter a known value for “Line resistance” (value range: 0.0 to 100.0 ohms) or measure the line resistance by actuating the **Measure** button.



You are prompted to short-circuit the sensor. When you confirm the message with **OK**, the transmitter measures the line resistance.

Select **Send Data to Device** to perform 2-wire compensation.

Config Mode

Config Tab - RTD (Other Sensors)

The screenshot shows the 'Config' tab of the Paraly_SW111 software. The window has a title bar with the application name and standard Windows icons. Below the title bar are four tabs: 'Config' (selected), 'Measure', 'Simulation', and 'Ident'. The main area contains several sections: 'Sensor' with a dropdown set to 'RTD'; 'RTD type' with a dropdown set to 'Pt xxx'; 'Connection' with a dropdown set to '2-wire'; 'Basic value at 0°C' with a text box containing '25' and a unit dropdown set to 'Ohm'; 'Line Resistance' with a text box containing '25' and a unit dropdown set to 'Ohm', followed by a 'Measure' button; 'Start' and 'End' temperature ranges with text boxes containing '0' and '100' respectively, and a unit dropdown set to '°C'; 'Set actual meas value to' with 'Start' and 'End' buttons; 'Output' with a dropdown set to '0 - 20 mA'; 'Characteristic curve' with a dropdown set to 'Linear'; 'Data to / from file' with 'Save' and 'Load' buttons; and 'Data to / from device' with 'Send' and 'Load' buttons. At the bottom, there are three status icons (red, yellow, green) and a 'Config' button.

When you have selected

Pt xxx or **Ni xxx**

from the

RTD type

field, you can use sensors with nominal values at 0 °C which are not included in the selection.

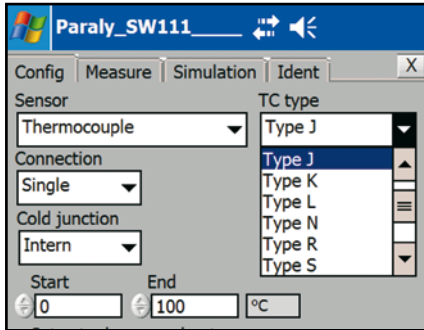
For a Pt 500, you would have to enter the value 500 (ohms) in the

Basic value at 0°C

field.

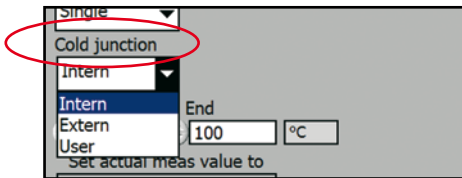
Config Mode

Config Tab - Thermocouple



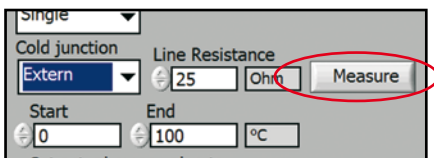
When you have selected **Thermocouple** in the **Sensor** field:

First select the respective TC type in the **TC types** field, here TC Type J, for example.

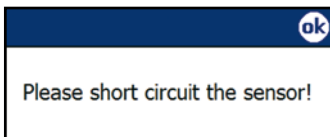


Under **Cold junction** select the type of reference junction compensation corresponding to your device configuration (here Internal).

You can choose from internal, external, and user specific.



When you have selected **external**, you either enter a known value for the external Pt100 in the "Line resistance" field (value range: 0.0 to 100.0 ohms) or measure the line resistance by actuating the **Measure** button.

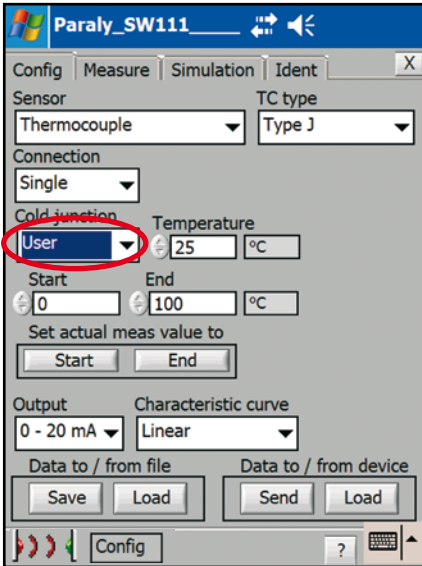


You are prompted to short-circuit the sensor. When you confirm the message with **OK**, the transmitter measures the line resistance.

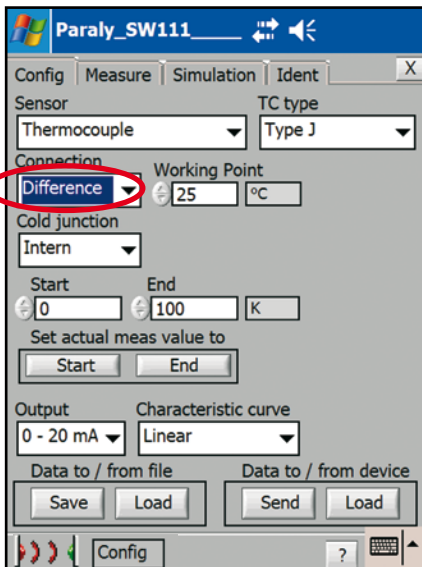
Select **Send Data to Device** to perform 2-wire compensation.

Config Mode

Config Tab - Thermocouple



When you have selected **user specific (User)**, enter the temperature of the reference junction in the **Temperature** field.



When you have selected **Difference** in the **Connection** field: First select the respective TC type in the **TC types** field.

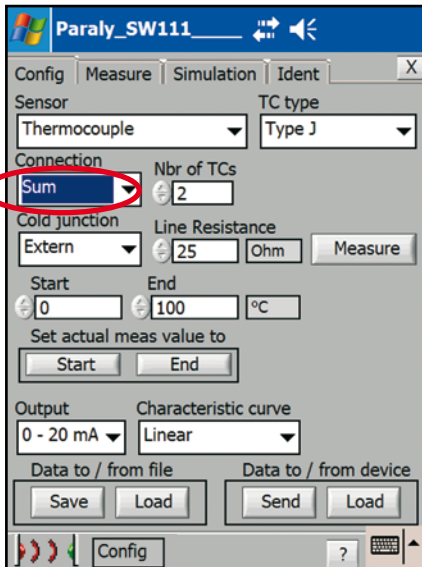
Calculation of the temperature difference $T_1 - T_2$ by differential connection of thermocouples of the same type requires the operating temp value (Working Point):

$$T_{op} = (T_1 - T_2) : 2 + T_2 [^{\circ}\text{C}]$$

Enter the operating temperature of your TC in the **Working Point** field.

Config Mode

Config Tab - Thermocouple



Notice:

TC Sum supports temperature measurement with a series connection of several thermocouples. This configuration increases the resulting thermoelectric voltage so that even very small temperature differences (to the reference junction) can be precisely measured.

When you have selected **Sum** in the **Connection** field:

Here, as well, you first select the respective TC type from the **TC types** field.

Then you make further adjustments.

Under

Cold junction you select the reference junction compensation. You can choose between external and user specific.

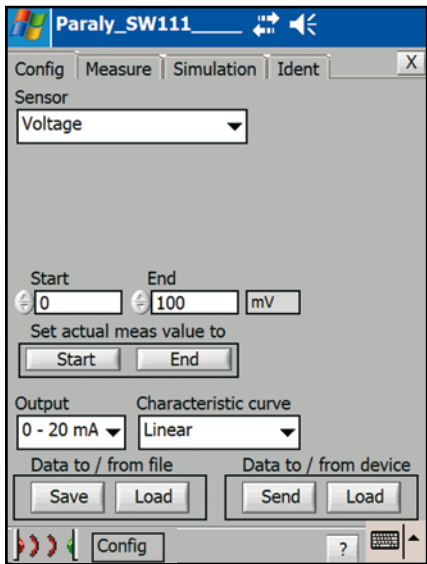
Enter the number of connected thermocouples in the **Number of TCs** field (max. 10).

When you have selected **user specific (User)**, proceed as described above.

In addition, you can enter the reference junction temperature in the **Temperature in °C** field.

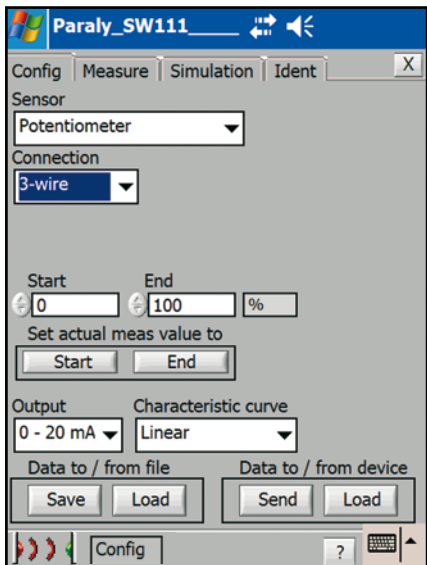
Config Mode

Config Tab - Voltage and Potentiometer



When you have selected **Voltage** in the **Sensor** field:

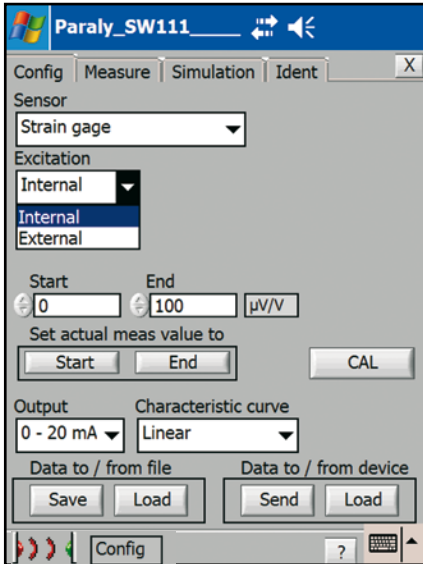
Enter the values corresponding to the desired measurement range.



When you have selected **Potentiometer** in the **Sensor** field, select the corresponding sensor connection in the **Connection** field. Then enter the values corresponding to the desired measurement range.

Config Mode

Config Tab - Strain Gage



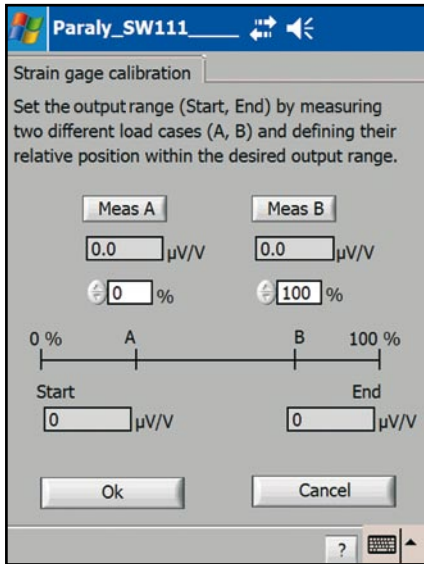
When you have selected **Strain gage** in the **Sensor** field and **Internal** or **External** in the **Excitation** field, you can operate strain gage bridges with internal supply (4-wire connection) or with external supply (6-wire connection) (see Appendix P 32000: Input Wiring). Enter all further values corresponding to the desired measurement range.

Notice:

“Set actual meas value to” can be used to adjust the measurement setup consisting of transmitter and strain gage. The currently measured value is stored as zero point (tare) or as end value. To do so, select the Start or End button.

The **Cal** button allows performing a 2-point adjustment with a known load or force. See next page.

Config Mode



The Cal menu allows performing a 2-point adjustment with a known load or force.

Zero point and sensitivity can be determined at any desired point of the characteristic.

Example:

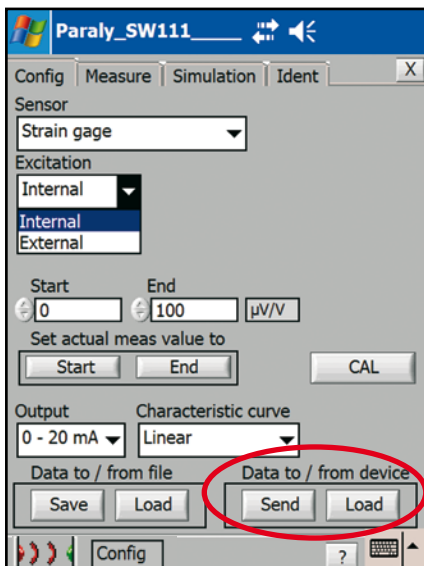
Load Cell (Compression)

1. Unload the sensor.
2. Actuate the Meas A button.
3. Enter a percentage value within the desired span corresponding to that sensor load, e.g. 0% when the unloaded sensor shall indicate the start of range.
4. Subject the sensor to a defined load.
5. Actuate the Meas B button.
6. Enter a percentage value within the desired span corresponding to that sensor load, e.g. 100% when the load shall indicate the end of range.
7. Confirm the calibration with OK.

The data will be saved and you return to the Config window.

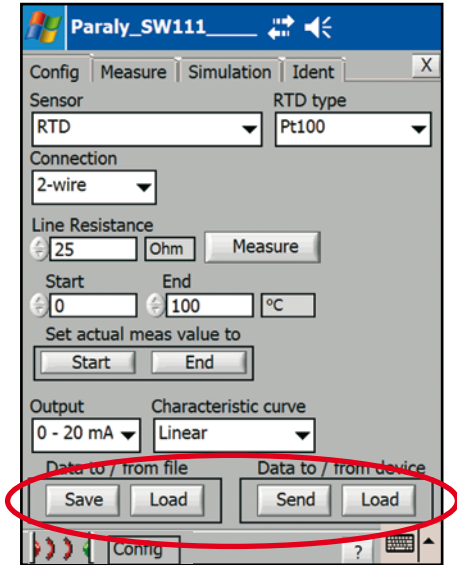
Select

Send beneath **Data to / from device** to send the data to the transmitter.



Config Mode

Config Tab - Load / Save / Send Data



Select **Save** beneath **Data to / from file**

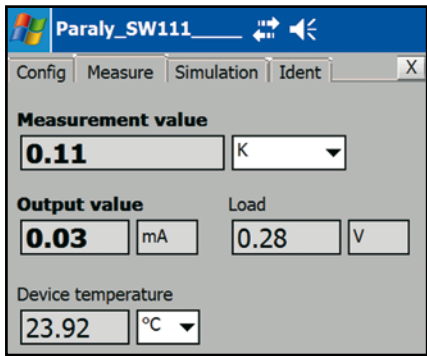
to save the configuration as file without sending it to the transmitter. The software generates a file name consisting of serial number and model name (in Offline Mode only model name). The file name can be changed as required. You can also use the TAG number of the point of measurement, for example. The file format is .cfg.

Load opens already saved configuration files.

By selecting **Send** beneath **Data to / from device** you send the data to the transmitter. **Load** retrieves the current configuration data from the transmitter.

Config Mode

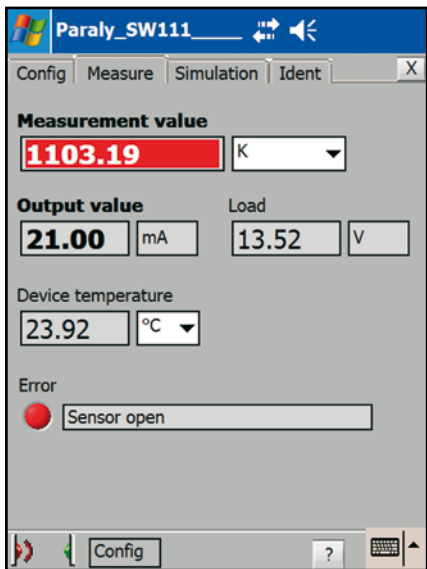
Measure Tab - Measured Values / Error Messages



When you select the **Measure** tab, you will see the currently measured value (**Measurement value**) and further data on the transmitter status.



When the red LED at the front of the transmitter housing signals an error (number of flash pulses indicating the error number - see Appendix for table of error messages), you can select the



Measure tab to read the correct error designation in the Error field. In addition, the error is indicated by a red Measurement value field.

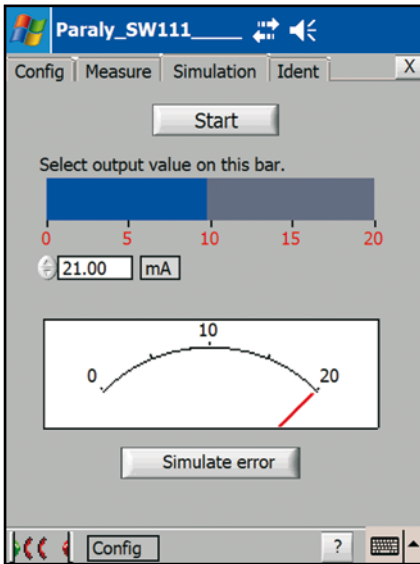
The displayed measurement value is invalid.

Notice:

With **Reset safe state** you can reset self-locking error messages (see Appendix: Error Signaling) provided that the error cause has been removed.

Config Mode

Simulation Tab



The simulation function allows testing the configuration of your installation without having to change the transmitter settings.

Caution! Simulation disrupts the measuring function of your device!

Before starting the simulation, make sure that the installation will remain in a safe condition.

Select Start to activate the simulation function.

Active simulation function is indicated by the red LED on the transmitter front (continuously lit).

You can adjust the output current or voltage using the slider (blue bar) or in the entry field, independently of the current input signal.

"Simulate error" generates an error signal at the output, 21 mA or 10.5 V (5.25 V).

Stop simulation with the Stop button. The transmitter resumes its measuring function.

Simulation is also stopped when you exit the Simulation tab.

Config Mode

Ident Tab - Tag / Password Protection

The screenshot shows the 'Ident' tab of the Paraly_SW111 configuration window. It contains several input fields and buttons:

- TAG**: A text box containing 'XXX' and a 'Send' button.
- Secure mode**: An unchecked checkbox.
- Password**: A text box containing '0000' and a 'Send' button.
- Transmitter type**: A dropdown menu showing 'STT1'.
- Serialnumber**: A text box containing '4294967295'.
- SW Version**: A text box containing '1.24.2'.
- Config revision counter**: A text box containing '1'.
- At the bottom, there are navigation buttons: a back arrow, a forward arrow, a 'Config' button, and a help icon.

The screenshot shows a dialog box titled 'Paraly_SW111' with a key icon at the top. The text inside reads: 'This device is in secure mode. A password is required to connect.' Below this is a 'Password:' text box. At the bottom are 'OK' and 'Cancel' buttons. A red oval highlights the key icon, the text, and the password field.

TAG

You can assign a tag (10 digits max.) to the transmitter. To do so, enter the desired designation in the **TAG** field. **SEND TAG** sends the selected designation to the transmitter.

Secure Mode

Access to the Configuration mode can be controlled by an individually adjustable access code (Password). This prevents unauthorized modification of device settings. Activate **Secure mode** and enter the desired password in the **Password** field (4 digits max.).

Select **Send Pass** to send it to the transmitter. The next time you call up the Config mode you will be prompted to enter this password.

Caution! If you lose your password, Config mode will be locked. In that case, please consult our technical support!

Notice: Write access to the adjusted configuration can also be blocked by the switches. The DIP switches of the transmitter must all be set to OFF, the rotary switches to 0 (read only mode).

Config Mode

Ident Tab - Transmitter Type / Serial Number / Firmware

The screenshot shows the 'Ident' tab of the Paraly_SW111 software. The interface includes a title bar with the Windows logo and the text 'Paraly_SW111'. Below the title bar is a menu bar with 'Config', 'Measure', 'Simulation', and 'Ident'. The 'Ident' tab is active, showing several input fields and buttons. The 'TAG' field contains 'XXX' and has a 'Send' button. Below it is a 'Secure mode' checkbox (unchecked) and a 'Password' field containing '0000' with a 'Send' button. The 'Transmitter type' field contains 'STT1'. Below that are two fields: 'Serialnumber' containing '4294967295' and 'SW Version' containing '1.24.2'. At the bottom is a 'Config revision counter' field containing '1'. The bottom status bar shows three colored buttons (red, yellow, green), a 'Config' button, a question mark, and a keyboard icon.

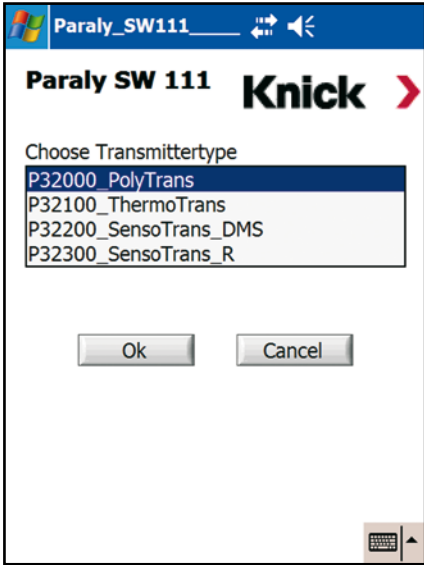
Field	Value
TAG	XXX
Secure mode	<input type="checkbox"/>
Password	0000
Transmitter type	STT1
Serialnumber	4294967295
SW Version	1.24.2
Config revision counter	1

The third section of the “Ident” tab provides information on the **Transmitter type**, **Serial number**, and software version of the firmware (**SW version**) of the transmitter.

The **Config revision counter** shows the number of configurations performed via the infrared port. A modification of the transmitter configuration increases the revision counter by 1 (factory setting: revision counter = 0).

Modifications made by DIP switches are not detected.

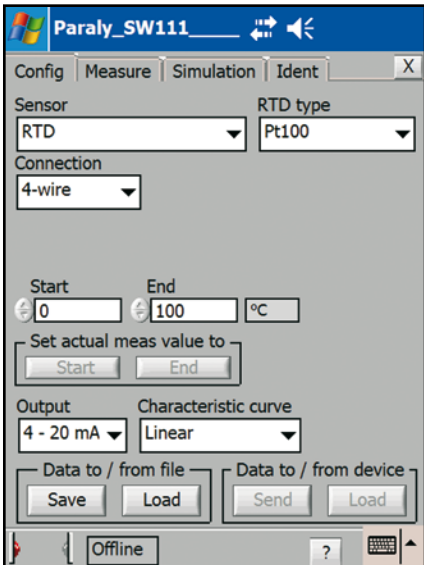
Offline Mode



After start of the Offline Mode you are prompted to select the transmitter which you want to configure.

You can choose from:
P32000 PolyTrans
P32100 ThermoTrans
P32200 SensoTrans DMS
P32300 SensoTrans R

The model designation is printed on the transmitter housing.

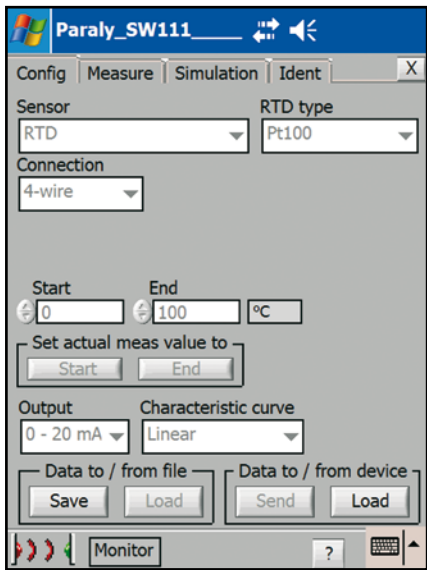


The information on configuration given on the pages 15 to 25 also apply to Offline Mode. Data exchange with the transmitter is not provided. The corresponding buttons are deactivated or you will receive a corresponding notice when you call up further tabs.

The Offline Mode allows creating and editing configurations without having to establish a connection to the transmitter as is required in Config Mode. That means that you can enter the data conveniently at your desk and send them to the transmitter at a later point in time.

Monitor Mode

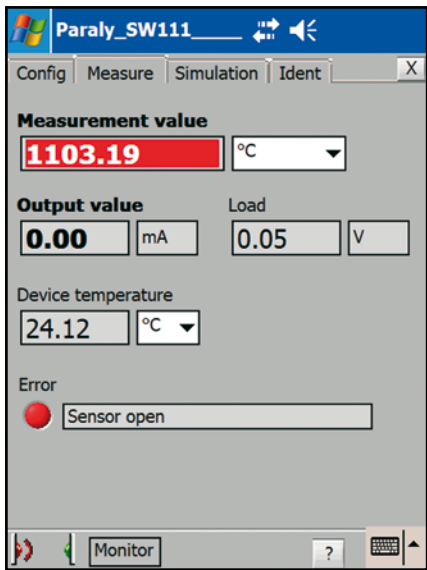
Config Tab / Measure



The Monitor Mode allows fast access to the transmitter data. For that purpose, you just have to activate the IR port of the respective transmitter using the front button.

In this mode, the adjusted configurations cannot be edited so that accidental mis-adjustments are impossible.

Select **Save** to store the configuration data as file, **Load** retrieves the current configuration data from the transmitter.

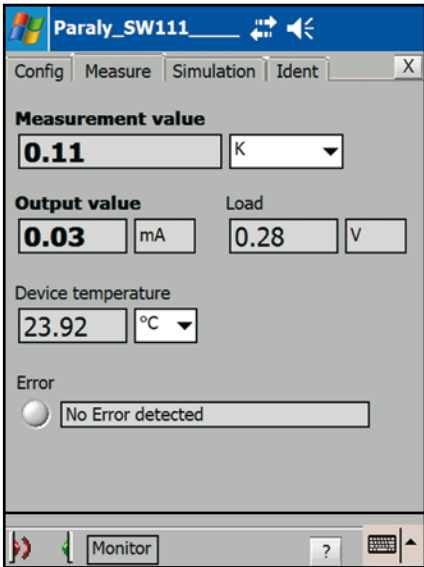


In combination with the error signaling, the Monitor Mode allows you finding the cause of error very quickly.

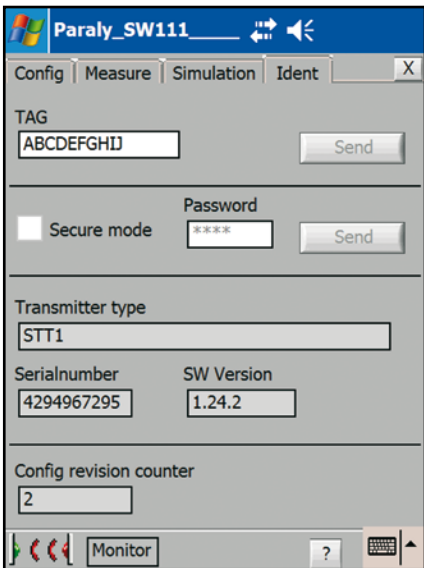
It is activated on the **Measure** tab.

Monitor Mode

Measure / Ident Tab



The currently measured values can be called up on the **Measure** tab.



The **Ident** tab provides information on the tag, the type of transmitter, and its software version.

Adapting the Transfer Curve

**Sampling Points
Polynomials**

Sampling Points

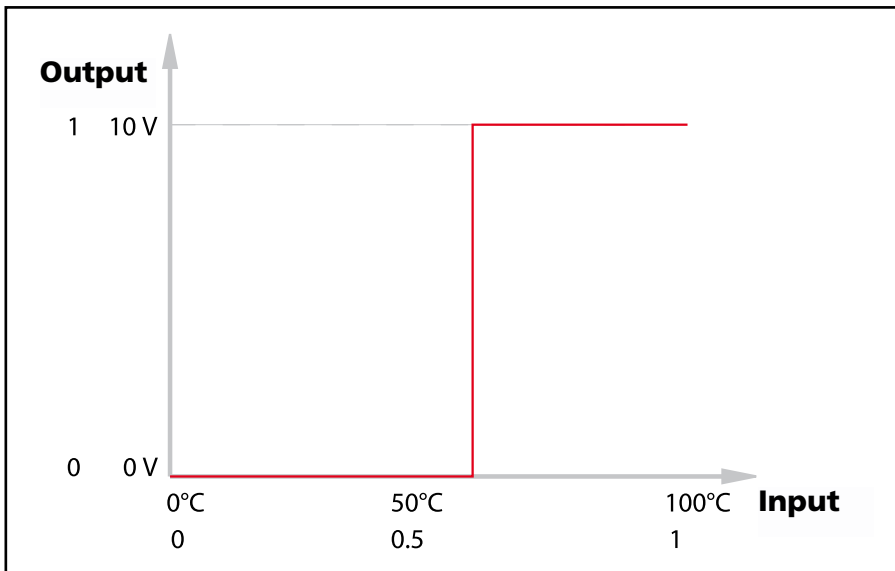
What are sampling points and what is their purpose?

The sampling points are value pairs which can be used for a simple fitting of the transfer function. The entered values are related to the configured measurement range which is standardized to a range of 0 to 1.

An interesting use of the sampling points is the threshold function for activating switching processes:

This shall be demonstrated by the following example:

Measurement in the range 0°C to 100°C using a Pt100 sensor with a threshold function at 60°C for a jump from 0 to 10V at the transmitter output.



Sampling Points

Overview - Sampling Points for Threshold Control

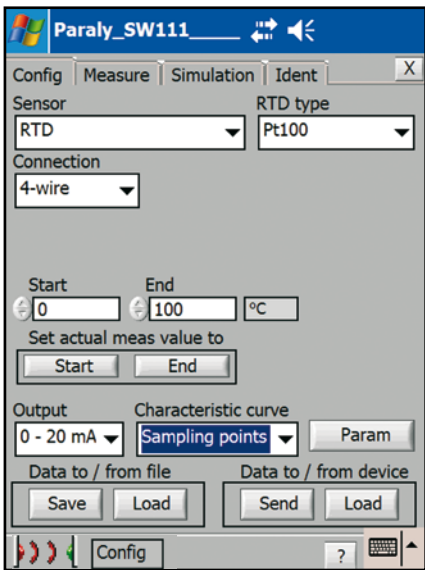
Measured value in °C	Value adaptation in the transmitter as defined by the Paraly SW111 software	Adapted for start and end value, standardized to 1	Adapted to sampling points, standardized to 1	Meas. value of sensor in °C (modified for IrDA output)	Output value in V
0		0	0	0	0
10		0.1	0	0	0
20		0.2	0	0	0
30		0.3	0	0	0
40		0.4	0	0	0
50		0.5	0	0	0
60		0.6	1	100	10
70		0.7	1	100	10
80		0.8	1	100	10
90		0.9	1	100	10
100		1	1	100	10

The table shows a jump of the output value at a temperature of 60°C. This is caused by the following sampling points:

Sampling points	
x	y
0	0
0.599	0
0.6	1
0.61	1
1	1

The following pages show how to program the transmitter correspondingly using the Paraly SW111 software.

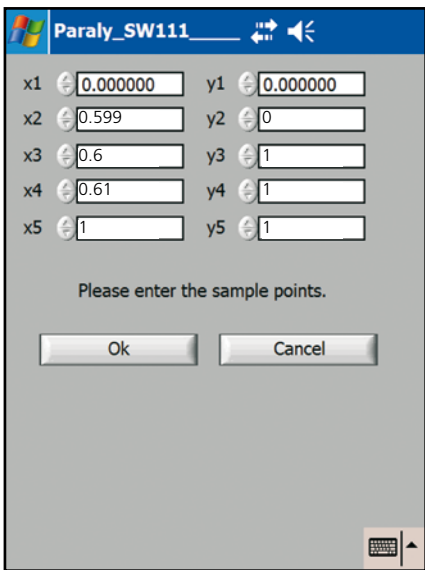
Sampling Points



In the Config window you select the **Sensor**, **Connection**, and **Output** values corresponding to your installation. Enter the values for **Start** and **End**. In our example these are 0°C and 100°C. Select

Characteristic curve:

Sampling points
and then actuate the **Param.** button.



Here you enter the data for the sampling points corresponding to the table on Page 35.

Select **OK** to store the data. Then return to the Config window and actuate the **Send** button to send the configuration to the transmitter.

Polynomials

The transfer function of the P 32xxx transmitters can be individually fitted by means of polynomials. This function can be used for linearization, for example. The user can record the characteristic function curve of the input value and calculate the parameters for a polynomial which describes the recorded curve. The input signal can be adjusted by means of polynomials up to the order $n = 10$. After calculation you must check whether the maximum error is tolerable for the application.

The polynomial which is applied to the transmitter input value (x) in % calibrated span, is expressed as follows:

$$\text{Out} = a_0 + a_1 (x) + a_2 (x^2) + a_3 (x^3) + \dots + a_9 (x^9)$$

with (x) and Out being standardized in the range 0 to 1 for calculation purposes and with the following values for Out:

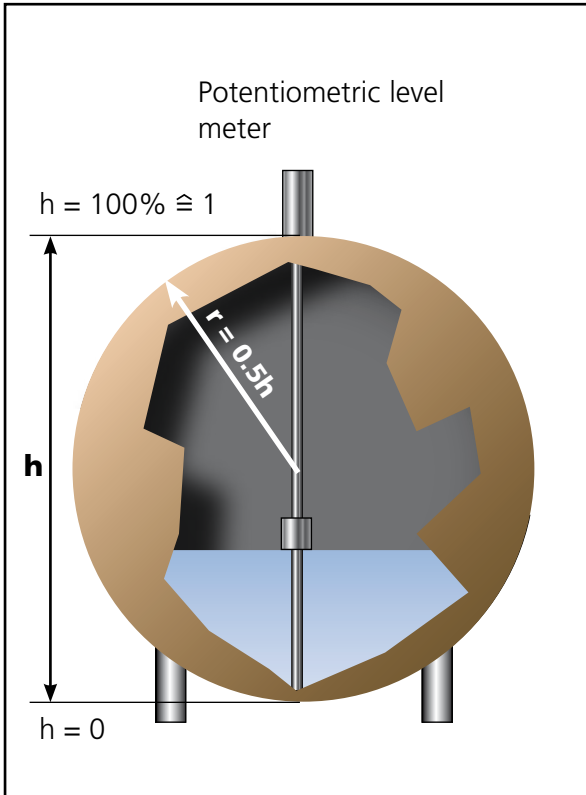
Out = 0 corresponds to an output value of 0% (e.g. 4 mA)

Out = 1 corresponds to an output value of 100% (e.g. 20 mA)

The principle shall be made clear on the following pages using the example of a spherical tank.

Signal Processing (Polynomials)

Signal Processing - Spherical Tank

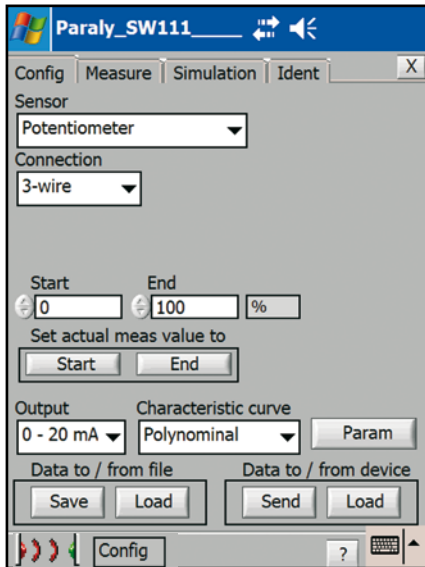


The potentiometric level meter outputs the current volume as percentage of total volume, with 100% meaning full tank and 0% meaning empty tank. For further calculation you must set 100% to 1 and consider the liquid levels as sections of the level height between 1 (full) and 0 (empty). The following polynomial gives the partial volume of the spherical segment depending on the height h (liquid level in tank):
Out = $3 h^2 - 2 h^3$
(See Appendix for derivation.)

The following pages describe how to use the polynomial coefficients in the software.

Signal Processing (Polynomials)

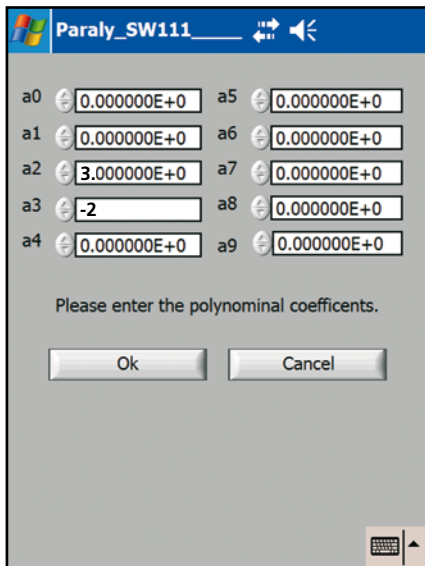
Polynomial Coefficients in the Software



In the Config window you select the **Sensor**, **Connection**, and **Output** values corresponding to your installation. Enter the values for **Start** and **End**. In our example these are 0 % and 100 %.

Select

Characteristic curve: Polynomial and actuate the **Param.** button.



Here, you enter the polynomial coefficients. For the spherical tank, these are the values

3 for **a2**

and

-2 for **a3**.

The other positions are filled automatically.

Select **OK** to store the data.

Signal Processing (Polynomials)

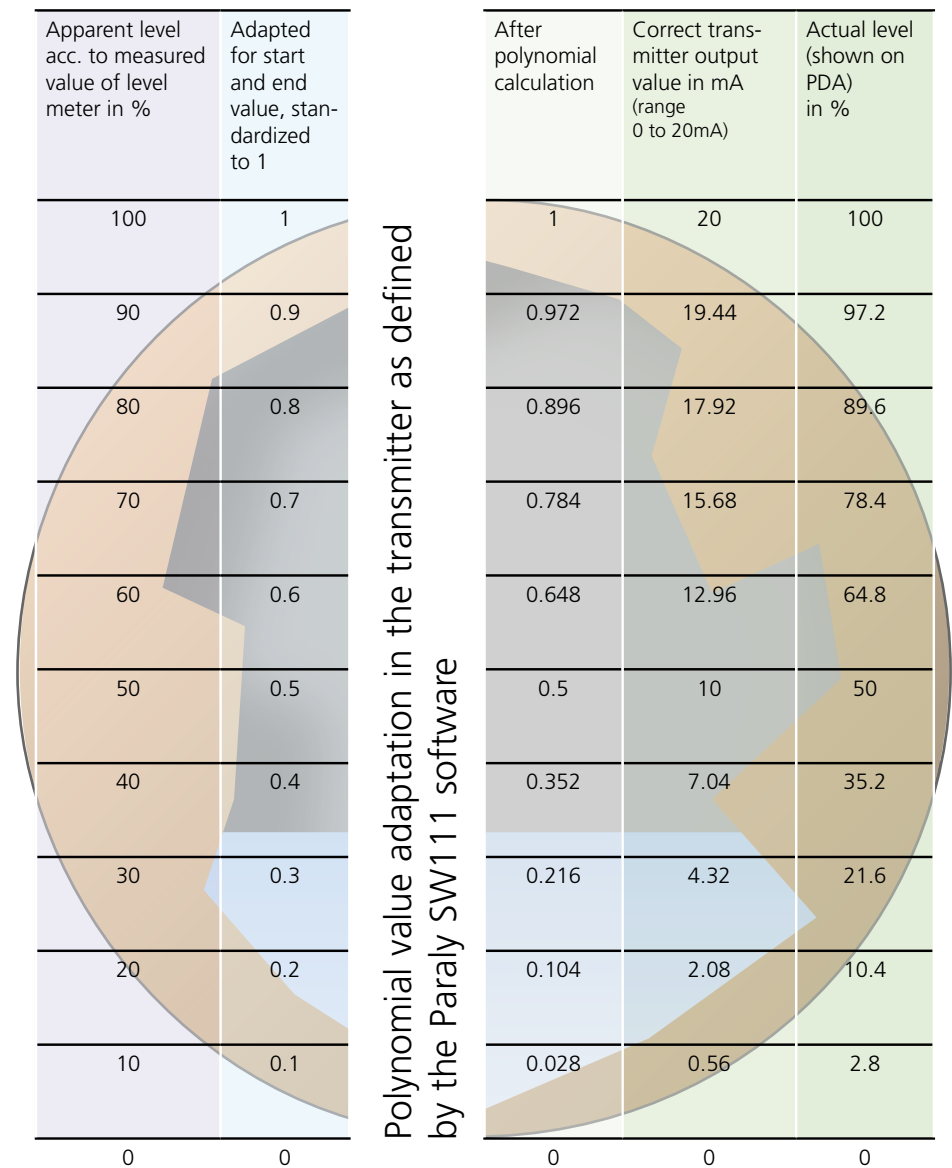
With this programming, the transmitter is now able to adjust the input values of the potentiometrical level meter in a way that the values at the transmitter output correspond to the actual volume conditions in the tank.

Diagram on next page

Projection of the course of value adaptation from detection to output to the spherical tank

Signal Processing (Polynomials)

Polynomial Coefficients - Level Measurement - Summary



Appendix

P 32000: Operation via IrDA Interface

Position of DIP switches	Rotary switches				Function
	1	2	3	4	
All ON*	0	0	0	0	IrDA configuration, read / write
All OFF*	0	0	0	0	IrDA configuration, read only

* All other switch positions: configuration acc. to switches, IrDA read only

P 32000: Error Signaling on the Device

Red: Error status; LED flashing indicates error number

No.	Error	M*	Output [mA]		Output [V]	
			4 ... 20	0 ... 20	0 ... 5	0 ... 10
1	Value below range limit		3.6	0	0	0
2	Value above range limit		21	21	5.25	10.5
3	Sensor short circuit		21	21	5.25	10.5
4	Sensor open		21	21	5.25	10.5
5	Pot/Strain gage: resistance error		21	21	5.25	10.5
6**	Output load error		3.6	0	0	0
7	Identification of connection		21	21	5.25	10.5
8	Switch misadjusted		21	21	5.25	10.5
9	Parameter error		21	21	5.25	10.5
10	Device error		3.6	0	0	0

M* Message configuration. Gray: self-locking

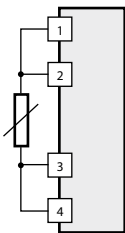
** Output load error for P32000P0/1x version only

Transmitters without approval to IEC/EN 61508 (SIL) use the “self-locking” message configuration only for error message 10.

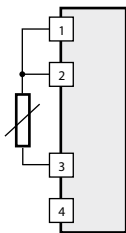
Device error: Please contact our technical support.

Appendix

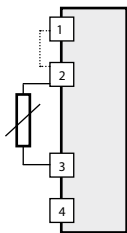
P 32000: Input Wiring



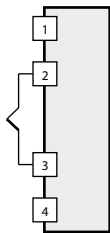
RTD / Resistor:
4-wire



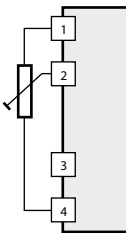
RTD / Resistor:
3-wire



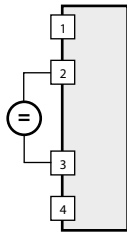
RTD / Resistor: 2-wire:
(For 2-wire measurement with $R > 5k\Omega$,
place jumper across terminal 1 and terminal 2)



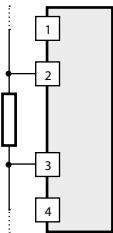
TC



Potentiometer /
3-wire

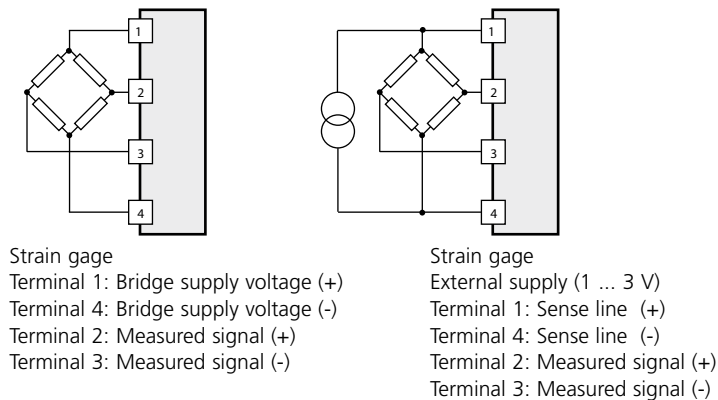
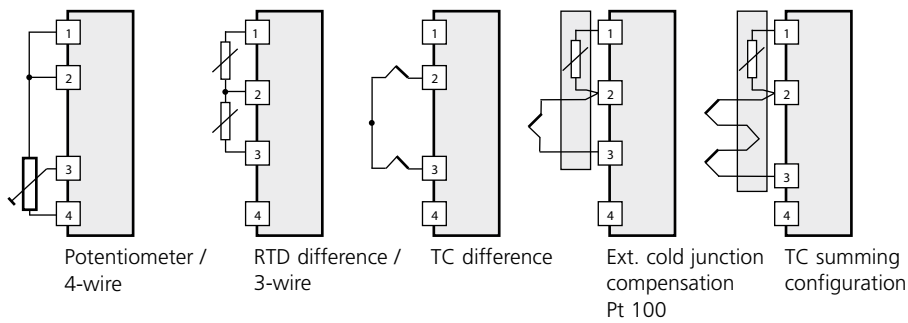


Voltage



Shunt

Extended Input Wiring via Paraly



Appendix

Derivation of the Standardized Equation for Determining the Liquid Level in a Spherical Tank

Sphere volume:

$$V_g = \frac{4}{3}\pi \cdot r^3$$

Volume of a spherical segment:

$$V_a = \frac{\pi}{3}h^2(3r - h)$$

Ratio of the volume of a spherical segment to the total sphere volume

$$\frac{V_a}{V_g} = \frac{\frac{\pi}{3}h^2(3r - h)}{\frac{4}{3}\pi \cdot r^3} = \frac{h^2 \cdot (3r - h)}{4 \cdot r^3}$$

standardized with $r=0.5$ and $h=0...1$

$$\frac{V_a}{V_g} = \frac{h^2 \left(\frac{3}{2} - h \right)}{4 \cdot \frac{1}{8}} = 3h^2 - 2h^3$$

Result:

$$a_2 = 3$$

$$a_3 = -2$$

Appendix

Possible Error Messages During IrDA Connection Establishment

No device found!

There is no transmitter with activated IrDA port within reach.

Unknown type of transmitter!

A transmitter has been found, but it is not supported by this Paraly version. Paraly 2.0 supports the P32000, P32100, P32200, and P32300 transmitters.

Different transmitter!

Config Mode identifies the transmitter by its serial number. If a new connection is established to a transmitter with different serial number (e.g. with the Reconnect button), this error message will be generated. You must select "Load data from device" first.

This prevents that a changed data record is accidentally written to a different target transmitter after a connection disruption.

Aborted by user!

The user has exited the Password Dialog with Cancel.

Communication error!

A transmitter is within reach, but uninterrupted communication is not possible.

